# BROWNFIELDS PROGRAM

## FIELD SAMPLING PLAN

FOR THE

## DALLAS WEST CHURCH OF CHRIST SITE

## BSA G163

## 3400 and 3500 North Hampton Road

## Dallas, Dallas County, Texas

Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg. D
Austin, Texas 78753

September 2014

Approved by:

| | |
|---|---|
| _____ | _____ |
| Nathan P. Hoppe date | Stephanie Kirschner date |
| TCEQ Project Manager | TCEQ Brownfields Program Manager |
| _____ | _____ |
| Alayna Goetsch date | Steven Childress date |
| TCEQ Brownfields Peer Reviewer | TCEQ Quality Assurance Specialist |

_____
Karen Peycke date
EPA Region 6 Brownfields Project Officer

Grant No. RP-00F67501

Document Control #: FSP -___

9878813

*Contractor Acknowledgement*

I am responsible for some or all of the contracted activities conducted under this field sampling plan (FSP). I have reviewed this Dallas West Church of Christ FSP and the TCEQ Quality Assurance Project Plan for the Superfund Programs (Revision 11.0, Q-TRAK# 14-453) (QAPP). I understand this FSP and the QAPP together constitute the technical requirements for the site, and I understand that the terms of the current Assessment, Investigation, and Remedial Services Contract apply. I understand the project objectives and acknowledge receipt of the plan.

| | |
|---|---|
| Leigh Grover, PG date | Sushama Paranjape date |
| Project Manager | Project Quality Assurance Officer |
| CB&I Environmental & Infrastructure, Inc. | CB&I Environmental & Infrastructure, Inc. |

*Laboratory Acknowledgement*

I am responsible for some or all of the contracted activities conducted under this field sampling plan (FSP). I have reviewed this Dallas West Church of Christ FSP and the TCEQ Quality Assurance Project Plan for the Superfund Programs (Revision 11.0, Q-TRAK# 14-453) (QAPP). I understand the FSP and the QAPP together constitute the technical requirements for the site, and I understand that the terms of the current Assessment, Investigation, and Remedial Services Contract apply. I understand the project objectives and acknowledge receipt of the plan.

_____

Richard Rodriguez date
Laboratory Manager
Accutest Laboratories Gulf Coast

# FSP Distribution List

| Name | Title | Organization | Document Control No. |
|---|---|---|---|
| Leigh Grover | Project Manager | CB&I | FSP-1 |
| Sushama Paranjape | Project QA Officer | CB&I | FSP-2 |
| Richard Rodriguez | Laboratory Manager | Accutest Laboratories Gulf Coast | FSP-3 |
| Nathan P. Hoppe | Brownfields Project Manager | TCEQ | FSP-4 |
| Alayna Goetsch | Brownfields Peer Reviewer | TCEQ | FSP-5 |
| Stephanie Kirschner | Brownfields Program Manager | TCEQ | FSP-6 |
| Steven Childress | Project QA Specialist | TCEQ | FSP-7 |
| Karen Peycke | EPA Region 6 Brownfields Project Officer | EPA | FSP-8 |

## Table of Contents



## Appendices

## Tables



## Figures

# Superfund Program SOPs

| | |
|---|---|
| 1.2 | Preparation and Control |
| 1.3 | Site Restoration |
| 1.4 | Investigative-Derived Waste (IDW) |
| 1.5 | Decontamination |
| 2.4 | Below Ground Utility Survey |
| 3.0 | Geological Observations |
| 5.1 | Hollow Stem Borehole Advancement |
| 5.5 | Monitoring Well Installation and Completion |
| 5.6 | Monitoring Well Development/Abandonment |
| 6.1 | Documentation and Reporting |
| 6.3 | Volatile Organic Compound (VOC) Samples |
| 6.4 | Sample Handling and Control |
| 6.5 | Quality Control Samples |
| 7.1 | Water Level/Sediment Measurement |
| 7.3 | Purging a Monitoring Well With a Pump |
| 7.4 | Micro Purging a Monitoring Well |
| 7.5 | Measurement of Field Parameters |
| 7.8 | Groundwater Sampling Using Low-Flow Techniques |
| 10.2 | Soil Sampling Using a Split Barrel Sampler |
| 10.4 | Soil Sampling Using Direct Push |
| 17.1 | Global Positioning System Data Collection and Submission |

## List of Acronyms

| | |
|---|---|
| AST | Above ground storage tank |
| BGL | Below ground level |
| COC | Chemical of concern |
| DQO | Data quality objectives |
| DUS | Data usability summary |
| EDD | Electronic data deliverable |
| EPA | U. S. Environmental Protection Agency |
| FB | Field blank |
| FD | Field duplicate |
| FSP | Field sampling plan |
| GPS | Global positioning system |
| HASP | Health and safety plan |
| HRS | Hazard Ranking System |
| H&SO | Health and Safety Officer |
| IDW | Investigation derived waste |
| IRA | Immediate removal action |
| MCL | Maximum contaminant level |
| MDL | Method detection limit |
| MQL | Method quantitation limit |
| mg/kg | Milligrams per kilogram |
| mg/L | Milligrams per liter |
| MS/MSD | Matrix spike/matrix spike duplicate |
| NFA | No Further Action |
| PAH | Polynuclear aromatic hydrocarbons |
| PCL | Protective concentration limit |
| PM | Project manager |
| ppb | Parts per billion |
| ppm | Parts per million |
| PST | Petroleum Storage Tank |
| PWS | Public water system |
| QAPP | *TCEQ Quality Assurance Project Plan for the Superfund Programs* |
| QA | Quality assurance |
| QC | Quality control |
| RCRA | Resource Conservation and Recovery Act |
| SDL | Sample detection limit |
| SOP | Standard operating procedure |
| SVOC | Semi volatile organic compound |
| TCEQ | Texas Commission on Environmental Quality |
| TRRP | Texas Risk Reduction Program |
| TPH | Total petroleum hydrocarbons |
| UST | Underground Storage Tank |
| VOA | Volatile organic analysis |
| VOC | Volatile organic compound |
| WO | Work order |

# 1.0 Introduction and Data Quality Objectives

This site-specific field sampling plan (FSP) and the TCEQ *Quality Assurance Project Plan for the Superfund Programs* (Revision 11.0, Q-TRAK# 14-453) (QAPP) constitute the technical requirements for the Brownfields Phase II Environmental Site Assessment (ESA) at the Dallas West Church of Christ Site (the Site). This FSP and QAPP shall function as a stand-alone project document for the Site. The work associated with this FSP is being conducted under Contract No. 582-14-40666. The reference documents followed in the preparation of this FSP are EPA/540/G-91/013 "Guidance for Performing Preliminary Assessments under CERCLA," EPA/540-R-92-021 "Guidance for Performing Site Inspections under CERCLA," and those documents listed in Element A.1 of the QAPP.

The TCEQ Project Manager (PM) will distribute the QAPP and FSP to the TCEQ project personnel, the EPA Region 6 project personnel, and the contractor presented in the project organization chart in Figure 1.

## 1.1 Site Location and Description

This Site is located 0.95 miles northwest of the RSR Corporation facility, a U.S. EPA Superfund Site (RSR Corporation Federal Superfund Site). The Site is located at 3400 and 3500 North Hampton Road, Dallas, Dallas County, Texas and is presented in Figure 2, Site Location Map. The RSR Corporation Federal Superfund Site is an abandoned secondary lead smelter facility which processed used batteries and other lead-containing materials. Historical activities conducted on the RSR Corporation Federal Superfund Site may have resulted in aerial deposition of metals onto the surface soils of the Site. Additionally, Mr. Sammie Berry, Minister of the church, indicated the site was historically a lake and had uncontrolled solid waste disposal. The location and types of waste disposed at the dump is unknown.

The Site consists of two (2) irregular shaped parcels of land comprising approximately 248,205 square feet. On-site is a 12,224 square foot two-story church and office, a 2,964 square foot one-story structure used to house clothing and other items for the needy, an associated asphalt and concrete parking lot, and undeveloped vacant land. The office building is located in the southern portion of the Site. The church/office building is a masonry, block, and tilt-wall structure on a concrete slab. The one-story structure is a wood frame building on a concrete slab. The property was undeveloped land prior to 1979 construction of the current church/office building. The future use of the Site is for church related activities and the construction of a community garden for local residential use.

The elevation at the Site is approximately 407 feet above mean sea level. The geologic stratigraphic unit for the area is alluvium from the Phanerozoic/Cenozoic/Quaternary/

Holocene eras. The alluvium consists of alluvial and low terrace deposits along streams, sand, silt, clay, and gravel where thickness is variable. The Site is surrounded by commercial properties to the northwest, vacant land and baseball fields to the west, residential properties to the north, northeast, east, and south and a church to the southeast. The Site is approximately 0.75 miles southeast of the Trinity River. In the area, groundwater is approximately 10 to 30 feet below ground surface and is used primarily for irrigation. The groundwater gradient is anticipated to flow to the northeast, toward the Trinity River.

Sources of target chemicals of concern (COCs) may be the suspected uncontrolled solid waste dumped on the site and the RSR Corporation Federal Superfund Site. The contaminant migration pathways of concern are surface and subsurface soils and groundwater. The migration pathways anticipated to be complete are the surface soil pathway, soil-to-groundwater pathway, and the groundwater pathway. The church building on the Site is considered a potential sensitive receptor, due to the building's potential use as a day care and/or preschool facility. The proposed community garden is considered a sensitive receptor on the property.

## 1.2 Purpose

The purpose of this Phase II ESA is to:

- identify if metal contamination attributable to the RSR Corporation Federal Superfund Site is present in on-site soils or groundwater;
- determine if an uncontrolled solid waste dump was present on the Site; and
- determine if hazardous substances related to the Superfund Site and/or the potential uncontrolled solid waste dump are present on the Site and if those substances have released to environmental media.

If the concentrations of hazardous substances are below the applicable TRRP Tier 1 protective concentration levels (PCLs), the TCEQ may issue a no further action (NFA) letter for the Site.

## 1.3 Problem Definition

An August 1, 2014 Phase I ESA conducted at the Site identified one historical recognized environmental condition (HREC) and one environmental condition relating to the Site. Those conditions are:

- The identified HREC is the possible presence of metal-contaminated soils on-site as a result of aerial deposition from historical activities conducted at the nearby RSR Corporation Federal Superfund Site.

- The environmental condition relating to the Site is suspected use of the Site as a dump prior to current development.

## 1.4 Project Organization

The project team for the Site comprises the TCEQ project manager (PM), the TCEQ quality assurance (QA) specialist, and the Contractor PM, project QA officer, health and safety officer (H&SO), the data reviewer, and the subcontracted laboratories for this sampling event. The lines of authority and communication for the project are presented in the project organization chart in Figure 1.

In addition to the roles and responsibilities set forth in Element A.4 of the QAPP, the following additional responsibilities are assigned:

The TCEQ Project Manager is responsible for:

- Determining the project data quality objectives (DQOs);
- Planning the project and completing the activities described in this FSP;
- Collecting and documenting the circumstantial information, e.g. photographs, and evidence of owner/operator information available at the Site, to provide information for cost recovery activities, unless delegated to the contractor's PM;
- Preparing of the work order (WO) and necessary amendments;
- Overseeing the activities of the contractor;
- Verifying the work is complete according to the WO, this FSP, and the QAPP;
- Reviewing and approving of contractor invoices, unless delegated otherwise; and
- Distributing the approved FSP, and each addendum, to the TCEQ project personnel on the distribution list.

The TCEQ QA Specialist is responsible for:

- Reviewing and approving the FSP for the project;
- Providing technical assistance to the TCEQ Project Manager in the resolution of QA/QC or analytical chemistry issues; and
- Ensuring the project DQOs and measurement quality objectives (MQOs) were met by the contractor and analytical laboratory.

The Contractor is responsible for:

- Distributing the approved FSP, and each addendum, to Contractor personnel and subcontractors responsible for the work performed during this sampling event;
- Securing the signature from the laboratory documenting the laboratory has reviewed the analytical specifications of the FSP and QAPP and can meet the project objectives. The signature can be secure by original hard copy, fax, or by PDF transmittal via electronic mail;

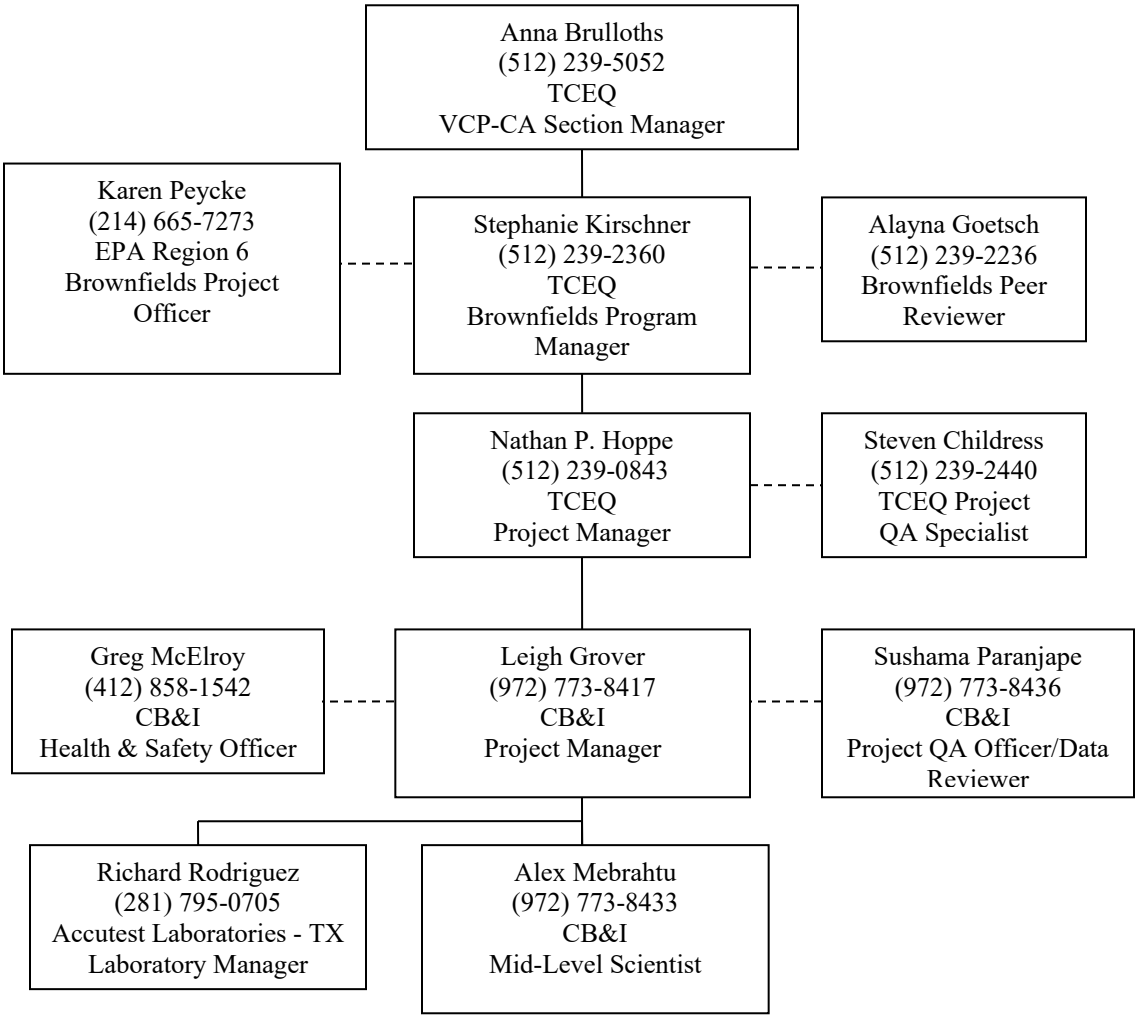
- Performing work, including work performed by the laboratories and all subcontractors, which meets the requirements of the contract, WO and QAPP necessary to fulfill the DQOs;
- Providing appropriate personnel to complete the project within the required timeframe;
- Verifying all on-site personnel adhere to the site-specific Health and Safety Plan (HASP);
- Communicating with the TCEQ PM and following any specific instructions issued;
- Communicating agreed upon changes to the subcontractors;
- Timely submittal of invoices; and
- Determining the type, frequency, and mechanism of communication with subcontractors; the roles and responsibilities of subcontractors; the procedures to monitor subcontractors.

## 1.5 Schedule of Activities

The sampling event will follow the schedule given in the project schedule in Appendix C of this FSP. If additional work is added by the TCEQ beyond the proposed scope, then the due dates of the project tasks listed in the project schedule will be modified accordingly in the amended schedule. The following tasks related to the collection of environmental samples are:

- Task 1: HASP Preparation and FSP Review.
- Task 2:
    - Mobilize to the site and collect a GPS coordinate for the site;
    - Meet with TCEQ and/or EPA representatives to outline the proposed boundaries (as understood from interviews with property representatives) for the community garden;
    - Install 15 soil borings across three identified sections of the site and collect soil samples following a tiered sampling/analysis system;
    - Install three (3) temporary monitoring wells and collect groundwater samples; and
    - Ship samples to the laboratory.
- Task 3: Review laboratory data and submit data review memorandum and associated analytical data packages.
- Task 4: Prepare and submit the Phase II ESA Report.
- Task 5: Coordinate with landfill for waste disposal classification/acceptance and remove investigation derived waste.

## Figure 1 Project Organization Chart



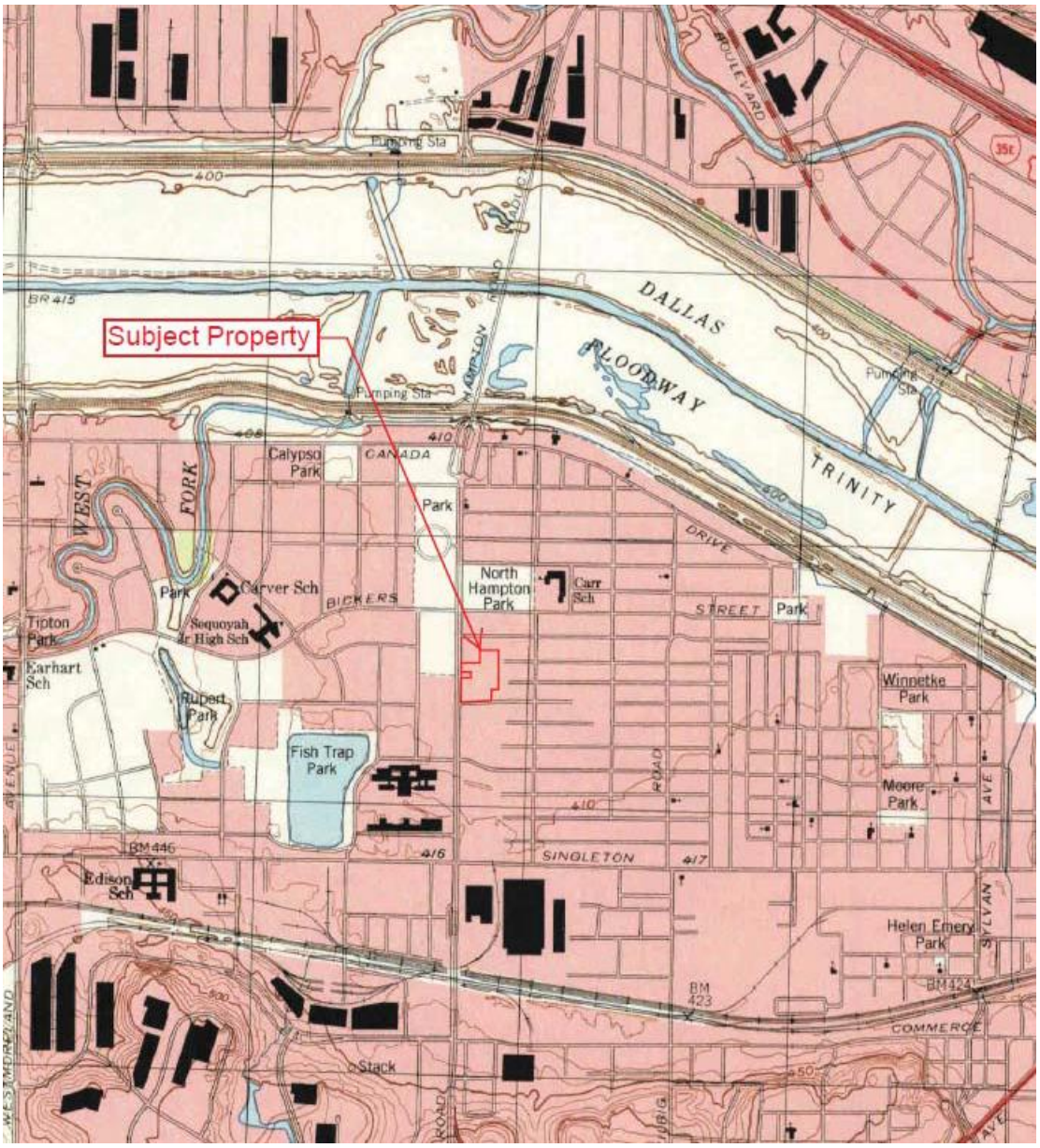



Figure 2 Site Location Map

Texas Commission on Environmental Quality
Dallas West Church of Christ
3400 and 3500 North Hampton Road
Dallas, Texas 75212
Source: *USGS Quadrangle: Dallas, TX 1995*
Approximate Scale: 1:24,000

# 2.0 Site and Project Summary

## 2.1 Site Description and Background

Refer to Section 1.1 for information on the site description and background.

## 2.2 Previous Investigations

No previous sampling has been conducted on the Site. The August 1, 2014 Phase I ESA identified the RSR Corporation Federal Superfund Site as a HREC and an alleged uncontrolled on-site waste dump as an environmental condition. The location and types of waste disposed is unknown.

## 2.3 Target Chemicals of Concern

The target chemicals of concern at the site are:

- Antimony
- Arsenic
- Lead
- Cadmium

# 3.0 Analytical Requirements

## 3.1 Analytical Requirements and Data Review Requirements

The level of required performance (LORP) is the concentration against which the data will be compared. The analytical results in soil will be compared to the Texas Risk Reduction Program (TRRP) Tier 1 residential 0.5 acre source area PCLs to determine if a release of antimony, arsenic, lead, and cadmium has occurred to the soils at the Site. The analytical results in groundwater will be compared to the Texas Risk Reduction Program (TRRP) Tier 1 residential Class 1 or 2 PCLs to determine if a release of antimony, arsenic, lead, and cadmium has occurred to groundwater at the Site. The LORP for soils is the lower of the total-soil-combined PCL ( $^{Tot}Soil_{Comb}$) and the soil-to-groundwater PCL ($^{GW}Soil_{Ing}$). However, if the Texas Specific Median Background (TSMB) Concentration is higher than the lowest PCL, then the TSMB Concentration will be used as the LORP for metals in the soils. The LORP for groundwater is the groundwater-to-groundwater ingestion PCL ($^{GW}GW_{Ing}$). The method quantitation limit (MQL) for the analytical method used should be below the LORP for the target COCs. If the MQL is greater than the LORP, the TCEQ PM will determine if a more sensitive analytical method is needed. If the MQL of the most sensitive analytical method is greater than the LORP, the MQL of that method becomes the LORP. The measurement performance criteria are specified in Element B of the QAPP.

### 3.1.1 Soil Analytical Requirements

Soil samples will be analyzed for VOCs (SW-846 Methods 5035A/8260C), SVOCs (SW-846 Methods 3550B/8270D), TPH (SW-846 Method 5035A/TCEQ Method 1005), and metals (SW-846 Methods 3050B/6020A). Table(s) 1 through 4 list the target COCs and the LORPs (i.e. the analytical levels of concern) for the soils for this sampling event. Analytes designated as target COCs for this assessment are denoted with an "X." The TRRP Tier 1 PCLs are taken from the June 29, 2012 TRRP PCL tables.

Table 1 Levels Of Required Performance For VOCs In Soil by SW-846 8260C

| Target COC | Analyte | CAS No. | TRRP Residential PCL 0.5 Acre Source | | Lab MQL (mg/kg) | Is Lab MQL< LORP? (Y/N) |
|---|---|---|---|---|---|---|
| | | | $^{Tot}Soil_{Comb}$ (mg/kg) | $^{GW}Soil_{Ing}$ (mg/kg) | | |
| ☐ | Acetone (2-propanone) | 67-64-1 | 9800 | 43 | 0.010 | Y |
| ☐ | Benzene | 71-43-2 | 120 | 0.026 | 0.00068 | Y |
| ☐ | Bromobenzene | 108-86-1 | 390 | 2.3 | 0.0004 | Y |
| ☐ | Bromodichloromethane | 75-27-4 | 98 | 0.065 | 0.00045 | Y |
| ☐ | Bromoform | 75-25-2 | 400 | 0.63 | 0.00075 | Y |
| ☐ | Bromomethane (methyl bromide) | 74-83-9 | 46 | 0.13 | 0.0019 | Y |
| ☐ | Butylbenzene, n- | 104-51-8 | 3300 | 150 | 0.00044 | Y |
| ☐ | Butylbenzene, sec- | 135-98-8 | 3300 | 85 | 0.00087 | Y |
| ☐ | Butylbenzene, tert- | 98-06-6 | 3300 | 100 | 0.00078 | Y |
| ☐ | Carbon disulfide | 75-15-0 | 4600 | 14 | 0.00058 | Y |
| ☐ | Carbon tetrachloride | 56-23-5 | 35 | 0.062 | 0.00086 | Y |
| ☐ | Chlorobenzene | 108-90-7 | 17 | 0.11 | 0.00093 | Y |
| ☐ | Chlorobromomethane (bromochloromethane) | 74-97-5 | 3300 | 3 | 0.0011 | Y |
| ☐ | Chloroethane (ethyl chloride) | 75-00-3 | 27000 | 31 | 0.0016 | Y |
| ☐ | Chloroform | 67-66-3 | 16 | 1 | 0.00043 | Y |
| ☐ | Chloromethane (methyl chloride) | 74-87-3 | 140 | 0.41 | 0.00077 | Y |
| ☐ | Chlorotoluene, o- (2-chlorotoluene) | 95-49-8 | 1200 | 9.1 | 0.00048 | Y |
| ☐ | Chlorotoluene, p- (4-chlorotoluene) | 106-43-4 | 1600 | 11 | 0.00041 | Y |
| ☐ | Cumene (isopropylbenzene) | 98-82-8 | 4300 | 350 | 0.0011 | Y |
| ☐ | Cyclohexane | 110-82-7 | 75000 | 5900 | 0.0076 | Y |
| ☐ | Cymene (isopropyltoluene) | 99-87-6 | 8200 | 230 | 0.0013 | Y |
| ☐ | Dibromo-3-chloropropane, 1,2- | 96-12-8 | 0.15 | 0.0017 | 0.0032 | N |
| ☐ | Dibromochloromethane (chlorodibromomethane) | 124-48-1 | 72 | 0.049 | 0.00091 | Y |
| ☐ | Dichlorobenzene, 1,2- | 95-50-1 | 720 | 18 | 0.00097 | Y |

| Target COC | Analyte | CAS No. | TRRP Residential PCL 0.5 Acre Source | | Lab MQL (mg/kg) | Is Lab MQL< LORP? (Y/N) |
|---|---|---|---|---|---|---|
| | | | $^{Tot}Soil_{Comb}$ (mg/kg) | $^{GW}Soil_{Ing}$ (mg/kg) | | |
| ☐ | Dichlorobenzene, 1,3- | 541-73-1 | 120 | 6.7 | 0.00062 | Y |
| ☐ | Dichlorobenzene, 1,4- | 106-46-7 | 250 | 201 | 0.00086 | Y |
| ☐ | Dichlorodifluoromethane | 75-71-8 | 1400 | 240 | 0.0011 | Y |
| ☐ | Dichloroethane, 1,1- | 75-34-3 | 11000 | 18 | 0.00041 | Y |
| ☐ | Dichloroethane, 1,2- | 107-06-2 | 11 | 0.014 | 0.00048 | Y |
| ☐ | Dichloroethylene, 1,1- | 75-35-4 | 2300 | 0.05 | 0.00042 | Y |
| ☐ | Dichloroethylene, cis-1,2- | 156-59-2 | 140 | 0.25 | 0.00046 | Y |
| ☐ | Dichloroethylene, trans-1,2 | 156-60-5 | 590 | 0.49 | 0.00044 | Y |
| ☐ | Dichloropropane, 1,2- | 78-87-5 | 60 | 0.023 | 0.00058 | Y |
| ☐ | Dichloropropane, 1,3- | 142-28-9 | 36 | 0.064 | 0.001 | Y |
| ☐ | Dichloropropane, 2,2- | 594-20-7 | 61 | 0.12 | 0.00054 | Y |
| ☐ | Dichloropropene, 1,1- | 563-58-6 | 36 | 0.13 | 0.00045 | Y |
| ☐ | Dichloropropene, cis 1,3- | 10061-01-5 | 8 | 0.0066 | 0.00045 | Y |
| ☐ | Dichloropropene, trans 1,3- | 10061-02-6 | 360 | 0.036 | 0.00051 | Y |
| ☐ | Ethyl benzene | 100-41-4 | 6400 | 7.6 | 0.00097 | Y |
| ☐ | Ethylene dibromide (dibromoethane, 1,2- ) | 106-93-4 | 0.73 | 0.00021 | 0.00042 | N |
| ☐ | Hexachlorobutadiene | 87-68-3 | 20 | 3.3 | 0.00069 | Y |
| ☐ | Hexanone, 2- | 591-78-6 | 270 | 0.32 | 0.0074 | Y |
| ☐ | Methyl acetate (acetic acid, methyl ester) | 79-20-9 | 82000 | 49 | 0.00388 | Y |
| ☐ | Methyl cyclohexane | 108-87-2 | 41000 | 16000 | 0.00137 | Y |
| ☐ | Methyl ethyl ketone (2-butanone) | 78-93-3 | 40000 | 29 | 0.0050 | Y |
| ☐ | Methyl isobutyl ketone (4-methyl-2-pentanone) | 108-10-1 | 5900 | 4.9 | 0.0063 | Y |
| ☐ | Methylene bromide (dibromomethane) | 74-95-3 | 81 | 1.1 | 0.0065 | Y |
| ☐ | Methylene chloride (dichloromethane) | 75-09-2 | 390 | 0.013 | 0.0025 | Y |
| ☐ | MTBE (methyl tert-butyl ether) | 1634-04-4 | 800 | 0.62 | 0.00051 | Y |
| ☐ | Naphthalene | 91-20-3 | 220 | 31 | 0.0020 | Y |
| ☐ | Propylbenzene, n- | 103-65-1 | 2200 | 45 | 0.0010 | Y |
| ☐ | Styrene | 100-42-5 | 6700 | 3.3 | 0.00092 | Y |
| ☐ | Tetrachloroethane, 1,1,1,2- | 630-20-6 | 65 | 1.4 | 0.00050 | Y |
| ☐ | Tetrachloroethane, 1,1,2,2- | 79-34-5 | 30 | 0.023 | 0.0068 | Y |
| ☐ | Tetrachloroethylene (perchlorethylene) | 127-18-4 | 100 | 0.050 | 0.001 | Y |
| ☐ | Toluene | 108-88-3 | 5900 | 8.2 | 0.001 | Y |
| ☐ | Trichlorobenzene, 1,2,3- | 87-61-6 | 120 | 26 | 0.00052 | Y |
| ☐ | Trichlorobenzene, 1,2,4- | 120-82-1 | 120 | 4.8 | 0.00050 | Y |
| ☐ | Trichloroethane, 1,1,1- | 71-55-6 | 52000 | 1.6 | 0.00063 | Y |
| ☐ | Trichloroethane, 1,1,2- | 79-00-5 | 18 | 0.02 | 0.00067 | Y |

| Target COC | Analyte | CAS No. | TRRP Residential PCL 0.5 Acre Source | | Lab MQL (mg/kg) | Is Lab MQL< LORP? (Y/N) |
|---|---|---|---|---|---|---|
| | | | $^{Tot}Soil_{Comb}$ (mg/kg) | $^{GW}Soil_{Ing}$ (mg/kg) | | |
| ☐ | Trichloroethylene | 79-01-6 | 120 | 0.034 | 0.00047 | Y |
| ☐ | Trichlorofluoromethane | 75-69-4 | 25000 | 130 | 0.00063 | Y |
| ☐ | Trichloropropane, 1,2,3- | 96-18-4 | 0.20 | 0.00053 | 0.00091 | N |
| ☐ | Trimethylbenzene, 1,2,4- | 95-63-6 | 150 | 49 | 0.00050 | Y |
| ☐ | Trimethylbenzene, 1,3,5- | 108-67-8 | 110 | 53 | 0.00094 | Y |
| ☐ | Vinyl chloride | 75-01-4 | 3.7 | 0.022 | 0.00058 | Y |
| ☐ | Xylene, m- | 108-38-3 | 8900 | 110 | 0.0018 | Y |
| ☐ | Xylene, o- | 95-47-6 | 48000 | 71 | 0.0010 | Y |
| ☐ | Xylene, p- | 106-42-3 | 8900 | 150 | 0.0018 | Y |

## Table 2 Levels Of Required Performance For SVOCs In Soil In SW-846 Method 8270D

| Target COC | Analyte | CAS No. | TRRP Residential PCL 0.5 Acre Source | | Lab MQL (mg/kg) | Is Lab MQL <LORP? (Y/N) |
|---|---|---|---|---|---|---|
| | | | $^{Tot}Soil_{Comb}$ (mg/kg) | $^{GW}Soil_{ING}$ (mg/kg) | | |
| ☐ | Acenaphthene | 83-32-9 | 3000 | 240 | 0.048 | Y |
| ☐ | Acenaphthylene | 208-96-8 | 3800 | 410 | 0.045 | Y |
| ☐ | Acetophenone | 98-86-2 | 6700 | 8.2 | 0.037 | Y |
| ☐ | Anthracene | 120-12-7 | 18000 | 6900 | 0.042 | Y |
| ☐ | Benz-a-anthracene | 56-55-3 | 5.7 | 18 | 0.066 | Y |
| ☐ | Benzaldehyde | 100-52-7 | 8200 | 11 | 0.059 | Y |
| ☐ | Benzo-a-pyrene | 50-32-8 | 0.56 | 7.6 | 0.052 | Y |
| ☐ | Benzo-b-fluoranthene | 205-99-2 | 5.7 | 60 | 0.042 | Y |
| ☐ | Benzo-g,h,i-perylene | 191-24-2 | 1800 | 46000 | 0.045 | Y |
| ☐ | Benzoic acid | 65-85-0 | 270000 | 190 | 0.27 | Y |
| ☐ | Benzo-k-fluoranthene | 207-08-9 | 57 | 620 | 0.074 | Y |
| ☐ | Benzyl alcohol | 100-51-6 | 6700 | 5.9 | 0.066 | Y |
| ☐ | Biphenyl, 1,1- | 92-52-4 | 3300 | 250 | 0.055 | Y |
| ☐ | Bis (2-chloroisopropyl) ether | 108-60-1 | 51 | 0.19 | 0.064 | Y |
| ☐ | Bis (2-ethyl-hexyl) phthalate | 117-81-7 | 43 | 160 | 0.13 | Y |
| ☐ | Bromophenyl phenylether, 4- | 101-55-3 | 0.28 | 0.35 | 0.051 | Y |
| ☐ | Butyl benzyl phthalate | 85-68-7 | 1600 | 260 | 0.054 | Y |
| ☐ | Caprolactam | 105-60-2 | 33000 | 47 | 0.054 | Y |
| ☐ | Carbazole | 86-74-8 | 230 | 4.6 | 0.053 | Y |
| ☐ | Chloro-3-methylphenol, 4- | 59-50-7 | 330 | 4.5 | 0.063 | Y |
| ☐ | Chloronaphthalene, 2- (chloronaphthalene, | 91-58-7 | 5000 | 670 | 0.049 | Y |

| Target COC | Analyte | CAS No. | TRRP Residential PCL 0.5 Acre Source | | Lab MQL (mg/kg) | Is Lab MQL <LORP? (Y/N) |
|---|---|---|---|---|---|---|
| | | | $^{Tot}Soil_{Comb}$ (mg/kg) | $^{GW}Soil_{ING}$ (mg/kg) | | |
| | beta) | | | | | |
| ☐ | Chlorophenol, 2- | 95-57-8 | 410 | 1.6 | 0.072 | Y |
| ☐ | Chrysene | 218-01-9 | 560 | 1500 | 0.071 | Y |
| ☐ | Cresol, o- (2-methylphenol) | 95-48-7 | 3300 | 7.1 | 0.073 | Y |
| ☐ | Cresol, p- (4-methylphenol) | 106-44-5 | 330 | 0.63 | 0.072 | Y |
| ☐ | Dibenz-a,h-anthracene | 53-70-3 | 0.55 | 15 | 0.058 | Y |
| ☐ | Dibenzofuran | 132-64-9 | 270 | 33 | 0.055 | Y |
| ☐ | Dichlorophenol, 2,4- | 120-83-2 | 200 | 0.35 | 0.053 | Y |
| ☐ | Diethyl phthalate | 84-66-2 | 53000 | 160 | 0.049 | Y |
| ☐ | Dimethyl phenol, 2,4- | 105-67-9 | 1300 | 3.2 | 0.057 | Y |
| ☐ | Dimethylphthalate | 131-11-3 | 53000 | 62 | 0.048 | Y |
| ☐ | Di-n-butyl phthalate | 84-74-2 | 6200 | 3300 | 0.053 | Y |
| ☐ | Di-n-octyl phthalate | 117-84-0 | 2600 | 1000000 | 0.044 | Y |
| ☐ | Fluoranthene | 206-44-0 | 2300 | 1900 | 0.055 | Y |
| ☐ | Fluorene | 86-73-7 | 2300 | 300 | 0.05 | Y |
| ☐ | Hexachlorobenzene | 118-74-1 | 1.1 | 1.1 | 0.054 | Y |
| ☐ | Hexachlorobutadiene | 87-68-3 | 20 | 3.3 | 0.061 | Y |
| ☐ | Hexachlorocyclopentadiene (HCCPD) | 77-47-4 | 14 | 19 | 0.079 | Y |
| ☐ | Hexachloroethane | 67-72-1 | 67 | 1.8 | 0.061 | Y |
| ☐ | Indeno-1,2,3-cd-pyrene | 193-39-5 | 5.7 | 170 | 0.061 | Y |
| ☐ | Isophorone | 78-59-1 | 4900 | 3 | 0.051 | Y |
| ☐ | Methylnaphthalene, 2- | 91-57-6 | 250 | 17 | 0.063 | Y |
| ☐ | Naphthalene | 91-20-3 | 220 | 31 | 0.06 | Y |
| ☐ | Nitroaniline, 4- | 100-01-6 | 220 | 0.11 | 0.055 | Y |
| ☐ | Nitrobenzene | 98-95-3 | 66 | 0.35 | 0.048 | Y |
| ☐ | Nitrophenol, 2- | 88-75-5 | 130 | 0.13 | 0.057 | Y |
| ☐ | Nitrophenol, 4- | 100-02-7 | 130 | 0.1 | 0.047 | Y |
| ☐ | Nitrosodiphenylamine, N- | 86-30-6 | 570 | 2.8 | 0.047 | Y |
| ☐ | Phenanthrene | 85-01-8 | 1700 | 420 | 0.047 | Y |
| ☐ | Phenol | 108-95-2 | 20000 | 19 | 0.076 | Y |
| ☐ | Pyrene | 129-00-0 | 1700 | 1100 | 0.075 | Y |
| ☐ | Trichlorophenol, 2,4,5- | 95-95-4 | 6700 | 34 | 0.052 | Y |
| ☐ | Trichlorophenol, 2,4,6- | 88-06-2 | 67 | 0.17 | 0.044 | Y |

## Table 3 Levels Of Required Performance For TPH In Soil TCEQ Method 1005

| Target COC | Analyte | CAS No. | TRRP Residential PCL 0.5 Acre Source | | Lab MQL (mg/kg) | Is Lab MQL < LORP? (Y/N) |
|---|---|---|---|---|---|---|
| | | | $^{Tot}Soil_{Comb}$ (mg/kg) | $^{GW}Soil_{ING}$ (mg/kg) | | |

| Target COC | Analyte | CAS No. | TRRP Residential PCL 0.5 Acre Source | | Lab MQL (mg/kg) | Is Lab MQL < LORP? (Y/N) |
|---|---|---|---|---|---|---|
| | | | $^{Tot}Soil_{Comb}$ (mg/kg) | $^{GW}Soil_{ING}$ (mg/kg) | | |
| ☐ | C6-C12 TPH Soil | TPH-1005-1 | 1600 | 65 | 11 | Y |
| ☐ | >C12-C28 TPH Soil | TPH-1005-2 | 2300 | 200 | 14 | Y |
| ☐ | >C12-C35 TPH Soil | TPH-1005-3 | 2300 | 200 | 14 | Y |
| ☐ | >C28-C35 TPH Soil | TPH-1005-4 | 2300 | 200 | 11 | Y |

Table 4 Levels Of Required Performance For Metals In Soil by SW-846 Methods 6020A

| Target COC | Analyte | CAS No. | TRRP Residential PCL 0.5 Acre Source | | | Texas-Specific Soil Background Concentrations (mg/kg) | Lab MQL (mg/kg) | Is Lab MQL < LORP? (Y/N) |
|---|---|---|---|---|---|---|---|---|
| | | | $^{Tot}Soil_{Comb}$ (mg/kg) | $^{GW}Soil_{Ing}$ (mg/kg) | Tier 1 $^{GW}$Soil for Secondary MCL (mg/kg) | | | |
| ☒ | Antimony | 7440-36-0 | 15 | 5.4 | --- | 1 | 0.004 | Y |
| ☒ | Arsenic | 7440-38-2 | 24 | 5.0 | --- | 5.9 | 0.004 | Y |
| ☐ | Barium | 7440-39-3 | 8100 | 440 | --- | 300 | 0.017 | Y |
| ☐ | Beryllium | 7440-41-7 | 38 | 1.8 | --- | 1.5 | 0.003 | Y |
| ☒ | Cadmium | 7440-43-9 | 52 | 1.5 | --- | --- | 0.004 | Y |
| ☐ | Chromium (total) | 7440-47-3 | 33000 | 2400 | --- | 30 | 0.008 | Y |
| ☐ | Copper | 7440-50-8 | 550 | 1000 | 800 | 15 | 0.012 | Y |
| ☒ | Lead (inorganic) | 7439-92-1 | 500 | 3.0 | --- | 15 | 0.007 | Y |
| ☐ | Manganese | 7439-96-5 | 3700 | 1200 | 50 | 300 | 0.025 | Y |
| ☐ | Nickel and compounds | 7440-02-0 | 840 | 160 | --- | 10 | 0.007 | Y |
| ☐ | Silver | 7440-22-4 | 97 | 0.48 | 0.39 | --- | 0.004 | Y |
| ☐ | Zinc | 7440-66-6 | 9900 | 2400 | 1600 | 30 | 0.032 | Y |

### 3.1.2 Groundwater Analytical Requirements

Groundwater samples will be analyzed for VOCs (SW-846 Methods 5030B/8260C), SVOCs (SW-846 Methods 3510C/8270D), TPH (TCEQ Method 1005), and metals (SW-846 Methods 3010A/6020A). Table(s) 5 through 8 list the target COCs and the LORPs (i.e. the analytical levels of concern) in the groundwater for this sampling event. Analytes designated target COCs for this assessment are denoted with an "X." The TRRP Tier 1 PCLs are taken from the June 29, 2012 TRRP PCL tables.

Table 5 Levels Of Required Performance For VOCs In Groundwater by SW-846 Method 8260C

| Target COC | Analyte | CAS No. | TRRP Residential PCL $^{GW}GW_{Ing}$ (mg/L) | Lab MQL (mg/L) | Is Lab MQL < LORP? (Y/N) |
|---|---|---|---|---|---|
| ☐ | Acetone (2-propanone) | 67-64-1 | 22 | 0.01 | Y |
| ☐ | Benzene | 71-43-2 | 0.005 | 0.00034 | Y |
| ☐ | Bromobenzene | 108-86-1 | 0.20 | 0.00029 | Y |
| ☐ | Bromodichloromethane | 75-27-4 | 0.015 | 0.00034 | Y |
| ☐ | Bromoform | 75-25-2 | 0.12 | 0.00044 | Y |
| ☐ | Bromomethane (methyl bromide) | 74-83-9 | 0.034 | 0.00051 | Y |
| ☐ | Butylbenzene, n- | 104-51-8 | 1.20 | 0.00039 | Y |
| ☐ | Butylbenzene, sec- | 135-98-8 | 0.98 | 0.00045 | Y |
| ☐ | Butylbenzene, tert- | 98-06-6 | 0.98 | 0.00045 | Y |
| ☐ | Carbon disulfide | 75-15-0 | 2.4 | 0.00036 | Y |
| ☐ | Carbon tetrachloride | 56-23-5 | 0.005 | 0.00043 | Y |
| ☐ | Chlorobenzene | 108-90-7 | 0.1 | 0.00027 | Y |
| ☐ | Chlorobromomethane (bromochloromethane) | 74-97-5 | 0.98 | 0.00042 | Y |
| ☐ | Chloroethane (ethyl chloride) | 75-00-3 | 9.8 | 0.00072 | Y |
| ☐ | Chloroform | 67-66-3 | 0.24 | 0.00035 | Y |
| ☐ | Chloromethane (methyl chloride) | 74-87-3 | 0.07 | 0.00063 | Y |
| ☐ | Chlorotoluene, o- (2-chlorotoluene) | 95-49-8 | 0.49 | 0.00036 | Y |
| ☐ | Chlorotoluene, p- (4-chlorotoluene) | 106-43-4 | 0.49 | 0.00031 | Y |
| ☐ | Cumene (isopropylbenzene) | 98-82-8 | 2.4 | 0.0004 | Y |
| ☐ | Cyclohexane | 110-82-7 | 120 | 0.00056 | Y |
| ☐ | Cymene (isopropyltoluene) | 99-87-6 | 2.4 | 0.00036 | Y |
| ☐ | Dibromo-3-chloropropane, 1,2- | 96-12-8 | 0.0002 | 0.0016 | N |
| ☐ | Dibromochloromethane (chlorodibromomethane) | 124-48-1 | 0.011 | 0.00034 | Y |
| ☐ | Dichlorobenzene, 1,2- | 95-50-1 | 0.6 | 0.00028 | Y |
| ☐ | Dichlorobenzene, 1,3- | 541-73-1 | 0.73 | 0.00033 | Y |
| ☐ | Dichlorobenzene, 1,4- | 106-46-7 | 0.075 | 0.00032 | Y |
| ☐ | Dichlorodifluoromethane | 75-71-8 | 4.9 | 0.0015 | Y |
| ☐ | Dichloroethane, 1,1- | 75-34-3 | 4.9 | 0.00034 | Y |
| ☐ | Dichloroethane, 1,2- | 107-06-2 | 0.005 | 0.00035 | Y |
| ☐ | Dichloroethylene, 1,1- | 75-35-4 | 0.007 | 0.00045 | Y |
| ☐ | Dichloroethylene, cis-1,2- | 156-59-2 | 0.07 | 0.0004 | Y |
| ☐ | Dichloroethylene, trans-1,2 | 156-60-5 | 0.1 | 0.00047 | Y |
| ☐ | Dichloropropane, 1,2- | 78-87-5 | 0.005 | 0.00033 | Y |
| ☐ | Dichloropropane, 1,3- | 142-28-9 | 0.0091 | 0.00032 | Y |
| ☐ | Dichloropropane, 2,2- | 594-20-7 | 0.013 | 0.00051 | Y |
| ☐ | Dichloropropene, 1,1- | 563-58-6 | 0.0091 | 0.00062 | Y |
| ☐ | Dichloropropene, cis 1,3- | 10061-01-5 | 0.0017 | 0.00029 | Y |
| ☐ | Dichloropropene, trans 1,3- | 10061-02-6 | 0.0091 | 0.00032 | Y |
| ☐ | Ethyl benzene | 100-41-4 | 0.7 | 0.00032 | Y |
| ☐ | Ethylene dibromide (dibromoethane, 1,2- ) | 106-93-4 | 0.00005 | 0.00034 | N |
| ☐ | Hexachlorobutadiene | 87-68-3 | 0.012 | 0.00049 | Y |

| Target COC | Analyte | CAS No. | TRRP Residential PCL $^{GW}GW_{Ing}$ (mg/L) | Lab MQL (mg/L) | Is Lab MQL < LORP? (Y/N) |
|---|---|---|---|---|---|
| ☐ | Hexanone, 2- | 591-78-6 | 0.12 | 0.0026 | Y |
| ☐ | Methyl acetate (acetic acid, methyl ester) | 79-20-9 | 24 | 0.00219 | Y |
| ☐ | Methyl cyclohexane | 108-87-2 | 120 | 0.00065 | Y |
| ☐ | Methyl ethyl ketone (2-butanone) | 78-93-3 | 15 | 0.0027 | Y |
| ☐ | Methyl isobutyl ketone (4-methyl-2-pentanone) | 108-10-1 | 2.0 | 0.0022 | Y |
| ☐ | Methylene bromide (dibromomethane) | 74-95-3 | 0.12 | 0.00045 | Y |
| ☐ | Methylene chloride (dichloromethane) | 75-09-2 | 0.005 | 0.0016 | Y |
| ☐ | MTBE (methyl tert-butyl ether) | 1634-04-4 | 0.24 | 0.0003 | Y |
| ☐ | Naphthalene | 91-20-3 | 0.49 | 0.0016 | Y |
| ☐ | Propylbenzene, n- | 103-65-1 | 0.98 | 0.00035 | Y |
| ☐ | Styrene | 100-42-5 | 0.1 | 0.00029 | Y |
| ☐ | Tetrachloroethane, 1,1,1,2- | 630-20-6 | 0.035 | 0.00037 | Y |
| ☐ | Tetrachloroethane, 1,1,2,2- | 79-34-5 | 0.0046 | 0.0004 | Y |
| ☐ | Tetrachloroethylene (perchlorethylene) | 127-18-4 | 0.005 | 0.00046 | Y |
| ☐ | Toluene | 108-88-3 | 1.0 | 0.00033 | Y |
| ☐ | Trichloro-1,2,2-trifluoroethane, 1,1,2- | 76-13-1 | 730 | 0.00075 | Y |
| ☐ | Trichlorobenzene, 1,2,3- | 87-61-6 | 0.073 | 0.00042 | Y |
| ☐ | Trichlorobenzene, 1,2,4- | 120-82-1 | 0.07 | 0.00041 | Y |
| ☐ | Trichloroethane, 1,1,1- | 71-55-6 | 0.20 | 0.00043 | Y |
| ☐ | Trichloroethane, 1,1,2- | 79-00-5 | 0.005 | 0.00035 | Y |
| ☐ | Trichloroethylene | 79-01-6 | 0.005 | 0.00049 | Y |
| ☐ | Trichlorofluoromethane | 75-69-4 | 7.3 | 0.00075 | Y |
| ☐ | Trichloropropane, 1,2,3- | 96-18-4 | 0.00003 | 0.00046 | N |
| ☐ | Trimethylbenzene, 1,2,4- | 95-63-6 | 1.22 | 0.00032 | Y |
| ☐ | Trimethylbenzene, 1,3,5- | 108-67-8 | 1.2 | 0.00035 | Y |
| ☐ | Vinyl chloride | 75-01-4 | 0.002 | 0.00079 | Y |
| ☐ | Xylene, m- | 108-38-3 | 10 | 0.00059 | Y |
| ☐ | Xylene, o- | 95-47-6 | 10 | 0.00028 | Y |
| ☐ | Xylene, p- | 106-42-3 | 10 | 0.00059 | Y |

## Table 6 Levels Of Required Performance For SVOCs In Groundwater by SW-846 Method 8270D

| Target COC | Analyte | CAS No. | TRRP Residential PCL $^{GW}GW_{Ing}$ (mg/L) | Lab MQL (mg/L) | Is Lab MQL < LORP? (Y/N) |
|---|---|---|---|---|---|
| ☐ | Acenaphthene | 83-32-9 | 1.5 | 0.0012 | Y |
| ☐ | Acenaphthylene | 208-96-8 | 1.5 | 0.0012 | Y |
| ☐ | Acetophenone | 98-86-2 | 2.4 | 0.0015 | Y |
| ☐ | Anthracene | 120-12-7 | 7.3 | 0.0014 | Y |
| ☐ | Atrazine | 1912-24-9 | 0.003 | 0.00279 | Y |
| ☐ | Benz-a-anthracene | 56-55-3 | 0.0013 | 0.0015 | N |
| ☐ | Benzaldehyde | 100-52-7 | 2.4 | 0.00234 | Y |
| ☐ | Benzo-a-pyrene | 50-32-8 | 0.0002 | 0.0013 | N |
| ☐ | Benzo-b-fluoranthene | 205-99-2 | 0.0013 | 0.0012 | Y |
| ☐ | Benzo-g,h,i-perylene | 191-24-2 | 0.73 | 0.0015 | Y |
| ☐ | Benzoic acid | 65-85-0 | 98 | 0.01 | Y |
| ☐ | Benzo-k-fluoranthene | 207-08-9 | 0.013 | 0.0015 | Y |
| ☐ | Benzyl alcohol | 100-51-6 | 2.4 | 0.00088 | Y |
| ☐ | Biphenyl, 1,1- | 92-52-4 | 1.2 | 0.00138 | Y |
| ☐ | Bis (2-chloroethoxy) methane | 111-91-1 | 0.00083 | 0.0012 | N |
| ☐ | Bis (2-chloroethyl) ether | 111-44-4 | 0.00083 | 0.00095 | N |
| ☐ | Bis (2-chloroisopropyl) ether | 108-60-1 | 0.013 | 0.0009 | Y |
| ☐ | Bis (2-ethyl-hexyl) phthalate | 117-81-7 | 0.006 | 0.0015 | Y |
| ☐ | Bromophenyl phenylether, 4- | 101-55-3 | 0.000061 | 0.0012 | N |
| ☐ | Butyl benzyl phthalate | 85-68-7 | 0.48 | 0.0013 | Y |
| ☐ | Caprolactam | 105-60-2 | 12 | 0.00189 | Y |
| ☐ | Carbazole | 86-74-8 | 0.046 | 0.0014 | Y |
| ☐ | Chloro-3-methylphenol, 4- | 59-50-7 | 0.12 | 0.0012 | Y |
| ☐ | Chloroaniline, p- | 106-47-8 | 0.0046 | 0.0011 | Y |
| ☐ | Chloronaphthalene, 2- (chloronaphthalene, beta) | 91-58-7 | 2.0 | 0.0013 | Y |
| ☐ | Chlorophenol, 2- | 95-57-8 | 0.12 | 0.00096 | Y |
| ☐ | Chlorophenyl phenylether, 4- | 7005-72-3 | 0.000061 | 0.0013 | N |
| ☐ | Chrysene | 218-01-9 | 0.13 | 0.0016 | Y |
| ☐ | Cresol, o- (2-methylphenol) | 95-48-7 | 1.2 | 0.00096 | Y |
| ☐ | Cresol, p- (4-methylphenol) | 106-44-5 | 0.12 | 0.0011 | Y |
| ☐ | Dibenz-a,h-anthracene | 53-70-3 | 0.0002 | 0.0014 | N |
| ☐ | Dibenzofuran | 132-64-9 | 0.098 | 0.0013 | Y |
| ☐ | Dichlorobenzidine, 3,3- | 91-94-1 | 0.002 | 0.0013 | Y |
| ☐ | Dichlorophenol, 2,4- | 120-83-2 | 0.073 | 0.0011 | Y |
| ☐ | Diethyl phthalate | 84-66-2 | 20 | 0.0014 | Y |
| ☐ | Dimethyl phenol, 2,4- | 105-67-9 | 0.49 | 0.0011 | Y |
| ☐ | Dimethylphthalate | 131-11-3 | 20 | 0.0014 | Y |
| ☐ | Di-n-butyl phthalate | 84-74-2 | 2.4 | 0.0013 | Y |
| ☐ | Dinitro-2-methylphenol, 4,6- (dinitro-o-cresol, 4, 6-) | 534-52-1 | 0.0024 | 0.0055 | N |
| ☐ | Dinitrophenol, 2,4- | 51-28-5 | 0.049 | 0.01 | Y |
| ☐ | Dinitrotoluene, 2,4- | 121-14-2 | 0.0013 | 0.0013 | N |
| ☐ | Dinitrotoluene, 2,6- | 606-20-2 | 0.0013 | 0.001 | Y |
| ☐ | Di-n-octyl phthalate | 117-84-0 | 0.49 | 0.0012 | Y |
| ☐ | Fluoranthene | 206-44-0 | 0.98 | 0.0014 | Y |
| ☐ | Fluorene | 86-73-7 | 0.98 | 0.0012 | Y |

| Target COC | Analyte | CAS No. | TRRP Residential PCL $^{GW}GW_{Ing}$ (mg/L) | Lab MQL (mg/L) | Is Lab MQL < LORP? (Y/N) |
|---|---|---|---|---|---|
| ☐ | Hexachlorobenzene | 118-74-1 | 0.001 | 0.0016 | N |
| ☐ | Hexachlorobutadiene | 87-68-3 | 0.012 | 0.0012 | Y |
| ☐ | Hexachlorocyclopentadiene (HCCPD) | 77-47-4 | 0.05 | 0.0012 | Y |
| ☐ | Hexachloroethane | 67-72-1 | 0.024 | 0.0013 | Y |
| ☐ | Indeno-1,2,3-cd-pyrene | 193-39-5 | 0.0013 | 0.001 | Y |
| ☐ | Isophorone | 78-59-1 | 0.96 | 0.0012 | Y |
| ☐ | Methylnaphthalene, 2- | 91-57-6 | 0.098 | 0.0011 | Y |
| ☐ | Naphthalene | 91-20-3 | 0.49 | 0.001 | Y |
| ☐ | Nitroaniline, 2- | 88-74-4 | 0.0073 | 0.0013 | Y |
| ☐ | Nitroaniline, 3- | 99-09-2 | 0.0073 | 0.0012 | Y |
| ☐ | Nitroaniline, 4- | 100-01-6 | 0.046 | 0.0014 | Y |
| ☐ | Nitrobenzene | 98-95-3 | 0.049 | 0.0012 | Y |
| ☐ | Nitrophenol, 2- | 88-75-5 | 0.049 | 0.0011 | Y |
| ☐ | Nitrophenol, 4- | 100-02-7 | 0.049 | 0.0072 | Y |
| ☐ | Nitrosodi-n-propylamine, N- | 621-64-7 | 0.00013 | 0.0011 | N |
| ☐ | Nitrosodiphenylamine, N- | 86-30-6 | 0.19 | 0.001 | Y |
| ☐ | Pentachlorophenol | 87-86-5 | 0.001 | 0.01 | N |
| ☐ | Phenanthrene | 85-01-8 | 0.73 | 0.0015 | Y |
| ☐ | Phenol | 108-95-2 | 7.3 | 0.0015 | Y |
| ☐ | Pyrene | 129-00-0 | 0.73 | 0.0014 | Y |
| ☐ | Trichlorophenol, 2,4,5- | 95-95-4 | 2.4 | 0.00098 | Y |
| ☐ | Trichlorophenol, 2,4,6- | 88-06-2 | 0.024 | 0.0011 | Y |

## Table 7 Levels Of Required Performance For TPH In Groundwater by TCEQ Method 1005

| Target COC | Analyte | CAS No. | TRRP Residential PCL $^{GW}GW_{Ing}$ (mg/L) | Lab MQL (mg/L) | Is Lab MQL < LORP? (Y/N) |
|---|---|---|---|---|---|
| ☐ | C6-C12 TPH Water | TPH-1005-1 | 0.98 | 0.59 | Y |
| ☐ | >C12-C28 TPH Water | TPH-1005-2 | 0.98 | 0.85 | Y |
| ☐ | >C12-C35 TPH Water | TPH-1005-3 | 0.98 | 0.85 | Y |
| ☐ | >C28-C35 TPH Water | TPH-1005-4 | 0.98 | 0.59 | Y |

Table 8 Levels Of Required Performance For Metals In Groundwater by SW-846 Methods 6020A

| Target COC | Analyte | CAS No. | TRRP Residential PCL $^{GW}GW_{Ing}$ (mg/L) | Lab MQL (mg/L) | Is Lab MQL < LORP? (Y/N) |
|---|---|---|---|---|---|
| ☒ | Antimony | 7440-36-0 | 0.006 | 0.00036 | Y |
| ☒ | Arsenic | 7440-38-2 | 0.01 | 0.00026 | Y |
| ☐ | Barium | 7440-39-3 | 2.0 | 0.000093 | Y |
| ☐ | Beryllium | 7440-41-7 | 0.004 | 0.00013 | Y |
| ☒ | Cadmium | 7440-43-9 | 0.005 | 0.00014 | Y |
| ☐ | Chromium (total) | 7440-47-3 | 0.1 | 0.000066 | Y |
| ☐ | Copper | 7440-50-8 | 1.3 | 0.000057 | Y |
| ☒ | Lead (inorganic) | 7439-92-1 | 0.015 | 0.00024 | Y |
| ☐ | Manganese | 7439-96-5 | 1.1 | 0.001 | Y |
| ☐ | Nickel and compounds | 7440-02-0 | 0.49 | 0.00005 | Y |
| ☐ | Silver | 7440-22-4 | 0.12 | 0.0001 | Y |
| ☐ | Zinc | 7440-66-6 | 7.3 | 0.00041 | Y |

### 3.1.3 Data Review

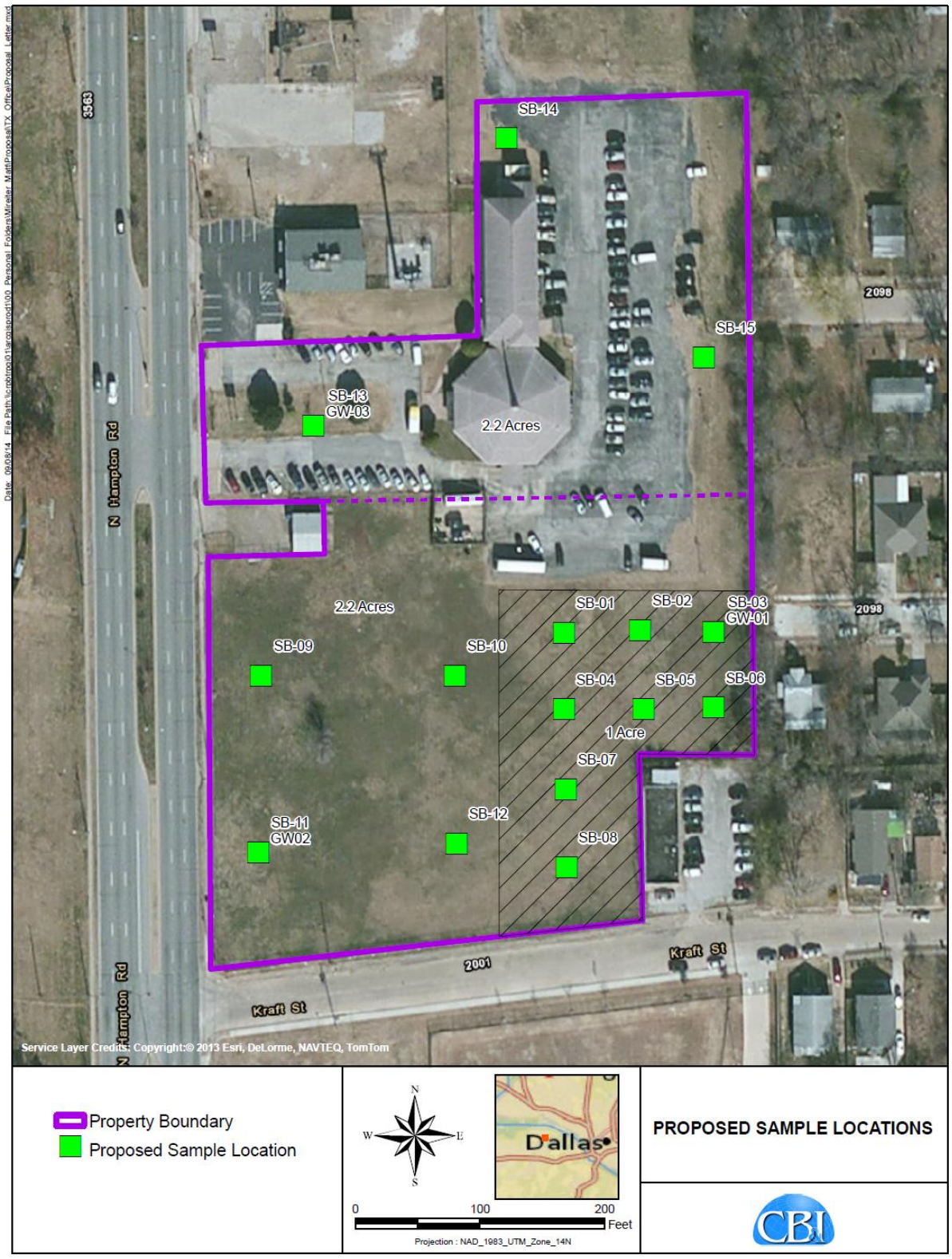
The laboratory will provide the contractor with an electronic data deliverable (EDD) that contains all pertinent information per contract specifications.

The laboratory shall review the data as specified in QAPP Element D.2.1.1 and shall submit the data package as specified in QAPP Element A.9.2. The independent data usability review shall be completed by the contractor as specified in QAPP Element D.2.1.2.

### 3.1.4 Data Review Memorandum

The data review memorandum shall be completed pursuant to the contract requirements.

## Figure 3 Proposed Sample Location Map




Note: The hatched line area in the southeast corner of the site is the proposed community garden.

# 4.0 Sampling Plan Design

The sampling design is judgmental, i.e. not statistical. Sample locations are selected to determine concentrations of the target COCs in background areas, in areas of known or suspected releases, in known or suspected migration pathways, and in known or suspected sources.

## 4.1 Sampling Locations and Rationale

The planned sample locations are indicated in Figure 3, Sample Location Map. The rationale for each sample location is presented in Table 9. Because the sampling plan is based on judgment, all of the samples listed in Table 9 are critical by location.

Table 9 Sample Rationale, Locations, and Analyses

| Sample ID | Sample Location (and depth if applicable) | Sample Rationale (including associated field QC samples) | Analysis* |
|---|---|---|---|
| *Surface Soil Samples* | | | |
| SB-01 through SB-08 | Eight (8) borings within the surveyed one (1) acre tract of land within Lot 4 will be collected on a 1/8 acre grid.<br><br>Borings will be advanced to a maximum depth of five (5) feet below ground surface (bgs). | Samples will be collected at 0-0.5 ft. bgs, 2.5-3 ft. bgs, and 4.5-5 ft. bgs. Samples collected from 0-0.5 ft. bgs will be analyzed for metals. The samples collected at greater depths will be analyzed for metals only if the 0-0.5 ft. bgs sample shows concentrations of metal COCs above the applicable TRRP Tier 1 residential PCLs. In addition, the soil samples obtained from each boring will be screened for organics with a photoionization detector (PID) field instrument. For each soil boring, the soil interval exhibiting the highest PID reading will be analyzed for VOCs, SVOCs, and TPH. If none of the soil samples collected from a given soil boring gives a positive PID reading, the samples will not be analyzed for VOCs, SVOCs, and TPH. | 1, 2, 3, 4 |
| SB-09 through SB-12 | Four (4) borings will be advanced in the remaining 2.21 acres of Lot 4. They will be collected on a ½ acre grid.<br><br>Borings will be advanced to a maximum depth of | Samples will be collected at 0-0.5 ft. bgs, 2.5-3 ft. bgs, and 4.5-5 ft. bgs. Samples collected from 0-0.5 ft. bgs will be analyzed for metals. The samples collected at greater depths will be analyzed for metals only if the 0-0.5 ft. bgs sample shows concentrations of metal COCs above the applicable TRRP | 1, 2, 3, 4 |

| Sample ID | Sample Location (and depth if applicable) | Sample Rationale (including associated field QC samples) | Analysis* |
|---|---|---|---|
| | five (5) feet below ground surface (bgs). | Tier 1 residential PCLs. In addition, the soil samples obtained from each boring will be screened for organics with a PID field instrument. For each soil boring, the soil interval exhibiting the highest PID reading will be analyzed for VOCs, SVOCs, and TPH. If none of the soil samples collected from a given soil boring give a positive PID reading, the samples will not be analyzed for VOCs, SVOCs, and TPH. | |
| SB-13 | West side of Lot 3 in the divided drive way entrance to the church parking lot.<br><br>The boring will be advanced to a maximum depth of five (5) feet below ground surface (bgs). | Samples will be collected at 0-0.5 ft. bgs, 2.5-3 ft. bgs, and 4.5-5 ft. bgs. Samples collected from 0-0.5 ft. bgs will be analyzed for metals. The samples collected at greater depths will be analyzed for metals only if the 0-0.5 ft. bgs sample shows concentrations of metal COCs above the applicable TRRP Tier 1 residential PCLs. In addition, the soil samples obtained from each boring will be screened for organics with a PID field instrument. For each soil boring, the soil interval exhibiting the highest PID reading will be analyzed for VOCs, SVOCs, and TPH. If none of the soil samples collected from a given soil boring give a positive PID reading, the samples will not be analyzed for VOCs, SVOCs, and TPH. | 1, 2, 3, 4 |
| SB-14 | North side of Lot 3, specifically, north of the church building and to the west of the parking lot.<br><br>The boring will be advanced to a maximum depth of five (5) feet below ground surface (bgs). | Samples will be collected at 0-0.5 ft. bgs, 2.5-3 ft. bgs, and 4.5-5 ft. bgs. Samples collected from 0-0.5 ft. bgs will be analyzed for metals. The samples collected at greater depths will be analyzed for metals only if the 0-0.5 ft. bgs sample shows concentrations of metal COCs above the applicable TRRP Tier 1 residential PCLs. In addition, the soil samples obtained from each boring will be screened for | 1, 2, 3, 4 |

| Sample ID | Sample Location (and depth if applicable) | Sample Rationale (including associated field QC samples) | Analysis* |
|---|---|---|---|
| | | organics with a PID field instrument. For each soil boring, the soil interval exhibiting the highest PID reading will be analyzed for VOCs, SVOCs, and TPH. If none of the soil samples collected from a given soil boring give a positive PID reading, the samples will not be analyzed for VOCs, SVOCs, and TPH. | |
| SB-15 | East side of Lot 3, specifically, in between the property boundary and the east side of the parking lot.<br><br>The boring will be advanced to a maximum depth of five (5) feet below ground surface (bgs). | Samples will be collected at 0-0.5 ft. bgs, 2.5-3 ft. bgs, and 4.5-5 ft. bgs. Samples collected from 0-0.5 ft. bgs will be analyzed for metals. The samples collected at greater depths will be analyzed for metals only if the 0-0.5 ft. bgs sample shows concentrations of metal COCs above the applicable TRRP Tier 1 residential PCLs. In addition, the soil samples obtained from each boring will be screened for organics with a PID field instrument. For each soil boring, the soil interval exhibiting the highest PID reading will be analyzed for VOCs, SVOCs, and TPH. If none of the soil samples collected from a given soil boring give a positive PID reading, the samples will not be analyzed for VOCs, SVOCs, and TPH. | 1, 2, 3, 4 |
| SB-16 | SB-01 | Field duplicate of SB-01, 0-0.5 foot sample. | 1, 2, 3, 4 |
| SB-17 | SB-07 | Field duplicate of SB-07, 0-0.5 foot sample. | 1, 2, 3, 4 |
| SB-18 | SB-09 | Field duplicate of SB-09, 0-0.5 foot sample. | 1, 2, 3, 4 |
| SB-19 | SB-14 | Field duplicate of SB-14, 0-0.5 foot sample. | 1, 2, 3, 4 |
| *Groundwater Samples* | | | |
| GW-01 | SB-03 will be converted to GW-01 which is one of the eight soil borings surveyed one (1) acre of land in Lot 4 will be converted into a | Assessing the groundwater from the monitor wells. | 1, 2, 3, 4 |

| Sample ID | Sample Location (and depth if applicable) | Sample Rationale (including associated field QC samples) | Analysis* |
|---|---|---|---|
| | temporary monitoring well.<br><br>Groundwater is expected to be encountered at 10-30 feet bgs. | | |
| GW-02 | SB-11, one of the four (4) soil borings within the remaining 2.21 acres of Lot 4 will be converted into a temporary monitoring well. | Assessing the groundwater from the monitor wells. | 1, 2, 3, 4 |
| GW-03 | SB-13 will be converted into a temporary monitoring well. | Assessing the groundwater from the monitor wells. | 1, 2, 3, 4 |
| GW-04 | MW-1 | Field duplicate of GW-01 | 1, 2, 3, 4 |
| *QC Blank Samples* | | | |
| TB-1 | Trip Blank | | 1 |
| FB-1 | Field Blank | | 1 |

* Methods listed in Section 4.1.1 of this FSP.

### 4.1.1 Sample Analysis

The analyses noted for the samples listed in Table 4.1 are described below.

1. VOCs by EPA SW-846 Method 8260C. Soil results will be reported on a dry weight basis.
2. TPH by TCEQ Method 1005. Soil results will be reported on a dry weight basis.
3. SVOCs by EPA SW-846 Method 8270D. Soil results will be reported on a dry weight basis.
4. Total Metals by EPA SW-846 Method 6020A. Soil results will be reported on a dry weight basis.

## 4.2 Field Quality Control Samples

Applicable field QC samples listed in Table 10 will be collected in accordance with Superfund SOP No. 6.5 (Quality Control Samples). Superfund SOP No. 6.5 Sections 3.1.3.3.a and 3.1.3.3.b are modified to require complete filling of the sample container, and then complete filling of the duplicate sample container. This procedure is applicable to all media.

Table 10 Frequency of Collection of Field Quality Control Samples

| Type of QC Sample | Frequency of Collection |
|---|---|
| Matrix Spike/Matrix Spike Duplicate (MS/MSD) | 1 per 20 project samples of each matrix. Collect the MS/MSD at a sample location suspected to be contaminated with low to medium levels of target COCs. Do not use highly contaminated samples for the MS/MSD. (To have usable MS/MSD QC data for the project, the sample designated for the MS/MSD analysis should be a project-specific sample.) |
| Field Blank (FB) | 1 per day per 20 samples of each matrix when analyzing for VOCs or other suspected airborne target COCs. Collect the field blank at a sample location before the sample is collected. |
| Equipment Rinsate Blank (ER) | One at the end of each day for each matrix is required when non-dedicated sampling equipment is used. |
| Trip Blank (TB) | 1 for each cooler containing VOC samples. The sample vials will be filled with ASTM Type II reagent grade water before sample containers are transported to the field. If the containers are coming from the laboratory, the trip blanks will be prepared by the laboratory. |
| Field Duplicates (FD) | 1 per day per approximately 10 project samples of each matrix. Collect the field duplicate at a sample location known or suspected to be contaminated with target COCs, immediately after the sample is collected. |
| Temperature Blank | 1 per cooler. |

## 4.3 Sampling Methods and Sample Handling

### 4.3.1 Field Sampling Procedures

All samples will be collected in accordance with the QAPP, this FSP and the Superfund SOPs listed in this FSP. All field activities, measurements, and field observations will be recorded in the field logbook. Sections 4.3.1.1.1 and 4.3.1.1.2 describe additional sampling procedures required for this sampling event.

Samples for VOC analysis will be collected first, in accordance with Superfund SOP No. 6.3 (Volatile Organic Compound (VOC) Samples).

The samples are handled as follows:

- Groundwater and surface water samples for VOC analysis not acid preserved must be thermally preserved in the field for transport and storage and analyzed within 7 days of collection.

- Groundwater and surface water samples for VOC analysis acid preserved must be thermally preserved in the field for transport and storage and analyzed within 14 days of collection.

After the VOC samples are collected, the metal samples will be collected, then the samples for TPH and SVOCs will be collected. Section 4.3.3 in this FSP describes the special custody procedures for VOC sample vials.

The GPS location information will be collected and recorded for all sampled points during the sample event as specified in Section 5.2 of this FSP.

#### *4.3.1.1 Sample Collection*

The Contractor will be accompanied by TCEQ staff during the entire sampling event as budget and schedules allow. Field sampling personnel will wear non-lubricated nitrile disposable gloves, or other suitable disposable gloves, during the handling of all sampling equipment and during sampling. The gloves will be changed between each sample location. Prior to sampling activities, sampling equipment shall be handled pursuant to Superfund SOP 1.5 (Decontamination).

##### 4.3.1.1.1 Soil Samples

The sample locations and depth are determined by the TCEQ PM based on site characteristics and potential exposure pathways. A surface inspection of the subject area will be made to locate pertinent features (e.g., rock outcrops, drainage patterns, surface runoff, and erosion areas) and to evaluate the relationship among these features and potential sources of COCs. The locations of sediment deposition areas are good indicators of surface runoff direction.

Soil borings will be advanced using the procedures in Superfund SOP No. 10.4 (Soil Sampling Using Direct Push). For soil samples collected using direct push, a dedicated acetate sleeve will be used. If dedicated equipment is not used, then equipment rinsate samples shall be collected as specified in Table 10 of this FSP. If refusal is encountered using direct push, the soil borings will be drilled using Superfund SOP No. 5.1 (Hollow Stem Borehole Advancement) and soil samples will be collected in accordance with Superfund SOP No. 10.2 (Soil Sampling Using a Split Barrel Sampler).

All soil sampling activities will be recorded in the logbook.

##### 4.3.1.1.2 Groundwater Samples

The sampling objective is to obtain a representative sample of the groundwater-bearing zone of interest without mixing the sample with stagnant (standing) water in the well casing.

#### 4.3.1.1.2.1 Groundwater Monitoring Well Installation

Three temporary monitoring well(s) will be installed. They will be installed from the following soil borings: SB-03 will be converted to GW-01, SB-11 will be converted to GW-02, and SB-13 will be converted to GW-03. The wells will be installed as described in Section 4.3.1.1.1 and completed in accordance with Superfund SOP 5.5 (Monitoring Well Installation and Completion). The monitoring well(s) will be developed prior to groundwater monitoring well sampling in accordance with Superfund SOP 5.6 (Monitoring Well Development and Abandonment). If auger refusal is encountered during monitor well installation, the temporary monitoring well will be installed and completed in the area suspected of having the next highest concentration of metal contaminants.

#### 4.3.1.1.2.2 Groundwater Samples from a Monitoring Well

All wells will be purged and sampled according to following SOPs:

- Superfund SOP No. 7.1 (Water Level/Sample Measurement)
- Superfund SOP No. 7.4 (Micro Purging a Monitor Well)
- Superfund SOP No. 7.8 (Groundwater Sampling Using a Low-flow Technique)

An unfiltered sample will be collected from each well and analyzed by the laboratory.

A minimum of three well volumes, including casing volume, shall be pumped or bailed from each monitoring well. Purging is considered complete when three (3) consecutive readings are consistent within 10% RPD for conductivity, ± 0.5°C for temperature, and within ± 0.5 pH units. The measurements will be collected in accordance with Superfund SOP No. 7.5 (Measurement of Field Parameters). When purging is complete, representative samples will be collected.

For wells pumped or bailed to dryness, the well shall be evacuated and allowed to recover to 90 percent of the original water volume before sample collection. In the event the well has not recovered to 90 percent after 24 hours, the volume recovered will be recorded into the field logbook, and a sample shall be drawn from the well.

#### 4.3.1.1.2.3 Groundwater Monitoring Well Abandonment

After monitor well sampling is complete, the well(s) will be plugged and abandoned in accordance with Superfund SOP 5.6 (Monitoring Well Development and Abandonment).

### 4.3.2 Sample Containers, Sample Preservation, and Holding Time

Sample containers, sample preservation requirements, sample volumes, and holding times are specified in Table B.2.2-1 of the QAPP.

### 4.3.3 Custody Procedures

Sample handling and custody will be conducted in accordance with Superfund SOP No. 6.4 (Sample Handling and Control). When the sample is introduced into the sample container, the lid or cap shall be tightened onto the container, and a custody seal shall be immediately wrapped around the lid or cap of the sampling container with the following exception:

- VOA sample vials from the same groundwater or surface water sample location will be filled, capped tightly, wrapped in protective wrapping to avoid breakage, and bagged together in a recloseable storage bag, e.g., a disposable plastic bag with a zipper-type closure. The bag will then be closed and a custody seal placed across the closure.

Custody seals will be affixed to every sample jar or container and to every sample shipping cooler except as noted above. The custody seals shall not be broken until received by the laboratory. Custody documentation will be maintained using a custody form that lists each sample and the individual(s) performing the sample collection, shipment, and receipt. A sample is considered in custody if the samples are:

- In the actual possession of a member of the sampling team;
- In the view of a member of the sampling team, after being in physical possession;
- Locked so that no one can tamper with the samples, after having been in physical possession, or;
- In a secured area restricted to authorized personnel.

The field sampling team will use the custody records to document the collection, shipping, and delivery of the samples to the laboratory. The individual who has custody of the sample(s) in their possession will sign the custody form relinquishing custody to the laboratory. The laboratory will immediately contact the Contractor PM if the custody record is not complete for samples received by the laboratory. The laboratory will keep the original custody record in the project files at the laboratory and send a copy of the completed record in the data packages issued to the Contractor.

The custody record will include:

- The unique identification number of each sample;
- The time and date of collection of each sample;
- The number and type of containers of each sample;
- The matrix of each sample;
- The methods of preservation of each sample;
- The analytical methods to be used by the laboratory for each sample;
- The sample(s) designated for the MS/MSD analyses;
- A note identifying samples suspected of containing high concentrations of chemicals;
- If a courier or common carrier is used to transport the sample cooler to the laboratory, the custody record will include the air bill number, the time and date the cooler is sealed, and the signature of the field personnel relinquishing custody to the courier or common carrier;
- The time and date the laboratory accepts custody of the samples and the signature of the laboratory personnel accepting that custody; and
- The temperature of the temperature blank measured by the laboratory upon receipt.

#### 4.3.4 Sample Identification and Documentation of Sampling Activities

Information regarding sample collection will be entered into the field logbook pursuant to Superfund SOP No. 6.1 (Documentation and Reporting). The following information will be recorded in the TCEQ field logbook:

- Date and time of sample collection;
- Environmental matrix and sample type (e.g., soil composite or groundwater grab);
- Sample collection method;
- Sample preservation;
- Name of the person who collected the sample;
- Sample identification number and depth measured from surface of the environmental medium sampled;
- Sample(s) designated for the MS/MSD analyses;
- Field measurements made on the sample, e.g., photoionization readings using a PID;

- When low-flow technology used, the flow rate, e.g., mL/min, as the sample was collected;
- GPS file number;
- Photograph number;
- Date and time of photograph with a description of the purpose of the photograph, e.g. "This photo documents the sample collected at location X of material released to soil from the corroded and leaking drums in the drum storage area observed and documented in photos 2 & 3.";
- Name of the person who took the photograph and direction the person was facing when the photograph was taken;
- Relevant observations such as soil color, obvious staining, and weather conditions; and
- Deviations from the QAPP, FSP, or SOPs, with the justification or rationale for each deviation documented.

Samples will be adequately marked for identification from the time of collection and packaging through shipping and storage. The sample identification scheme will include:

- Field sample ID;
- Project name and number;
- Sampling date and time;
- Name of the sample collector;
- Method of sample preservation; and
- Laboratory analyses required.

Sample identification will be as follows:

- Groundwater Samples: Groundwater samples will be identified using the prefix "GW" followed by a sequential number;

- Soil Samples: Surface and subsurface soil samples will be identified using the prefix "SB" followed by a sequential number;

- Field Duplicate Samples: For quality assurance purposes, the identification of field duplicate samples will not include any information that may reveal to the laboratory the identity of the primary samples. Field duplicate samples will have a sample number randomly selected by the contractor. The primary samples and associated field duplicate samples will be identified in the contractor's field notes. The field duplicate sample collection time will be a random increment of time after the collection time of the primary sample. For example, sample GW-76 that has a 14:30 collection time on the chain of custody form is the field duplicate of sample GW-15 that has a collection time of 14:05 on the chain of custody form.

Information regarding the actual collection time and the ID of the primary sample and the field duplicate sample will be recorded in the field logbook;

- Field Blanks: Field Blanks will be identified using the prefix "FB" followed by a sequential number;
- Trip Blanks: Trip Blanks will be identified using the prefix "TB" followed by a sequential number;
- Equipment Rinsate Blanks: Equipment rinsate blanks will be identified using the prefix "ER" followed by a sequential number.

At each sampling location, the collection of the sample will be documented by photographing the sample collection point and, if requested by the TCEQ, by recording the location with certified GPS equipment operated by GPS certified TCEQ staff or contractor personnel. If certified GPS equipment is not available, the sample locations will be identified and the method of identification and site sketch will be included in the field logbook.

# 5.0 Additional Field Activities

## 5.1 Property Access

Access agreements between landowners and TCEQ will be obtained prior to initiation of sample collection activities. Form TCEQ-10452 will be used to obtain written access agreements between landowners and TCEQ. In the event the TCEQ is unable to secure a written access agreement from a property owner, verbal agreement of granted access will be documented in the project field notes. If the property is abandoned or the owner cannot be reached, TCEQ Legal Division will determine the appropriate course of action to document access. Copies of the access agreements will be placed in the project file.

## 5.2 GPS Information

The contractor will record the GPS location of the site, and sampling locations and other pertinent site features as requested by the TCEQ. The contractor will submit all GPS information to the TCEQ as specified in the WO. The GPS data shall be collected pursuant to Superfund SOP No. 17.1 (GPS Data Collection and Submission).

## 5.3 Equipment Decontamination

Non-dedicated sampling equipment will be decontaminated prior to use and between each sampling location. A decontamination event at the end of every day and an equipment rinsate sample collected as specified in Table 10. The TCEQ PM may modify

the decontamination frequency if necessary. Decontamination of field equipment will be performed in accordance with Superfund SOP No. 1.5 (Decontamination).

## 5.4 Investigation Derived Waste

All investigation derived waste (IDW) will be handled in accordance with Superfund SOP No. 1.4 (Investigation-Derived Waste). The contractor will be responsible for collection, containerization, and disposal of all IDW.

Purge waters from wells will be managed according to guidance provided in Superfund SOP No. 1.4 (Investigation-Derived Waste) and "Management of Investigation-Derived Wastes During Site Inspections," EPA/540/G-91/009, May 1991. The preference is to leave both RCRA hazardous and non-hazardous IDW on-site whenever it complies with regulations and does not pose any immediate threat to human health and the environment.

## 5.5 Site Restoration

The work site and sampling locations will be restored to their original condition in accordance with Superfund SOP No. 1.3 (Site Restoration). Efforts will be made to minimize impacts to work sites and sampling locations, particularly residential properties and those properties in or near sensitive environments.

## 5.6 Health and Safety

The contractor will develop a site-specific Health and Safety Plan (HASP) to meet the project objectives. During all sampling activities, all field personnel will adhere to the HASP to ensure that all sample collection and decontamination are done in a safe manner. The purpose of this HASP is to assign responsibilities, establish personnel protection standards, specify safe operating procedures, and provide for contingencies that may arise while conducting this investigation. TCEQ personnel will adhere to the HASP while on site.

Prior to commencement of field activities, the contractor's designated H&SO will conduct a safety briefing to inform all personnel of the possible chemical and physical hazards. All personnel will be required to read and sign the HASP, and it will be readily available in the field at all times. The H&SO will conduct a daily safety meeting prior to initiating fieldwork each day to advise workers of ongoing and new health and safety concerns. During the daily safety meeting, the H&SO will identify all potential health and safety risks present at the Site. The H&SO will record the subjects covered during each daily safety briefing, as well as personnel in attendance. These records will become part of the project files. The H&SO will verify all field personnel have completed "OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120)"

training before beginning fieldwork and will verify at least one on-site worker has training in first aid and CPR.

While on-site during field activities, no personnel will eat, drink, or smoke, and all personnel will minimize hand to mouth contact.

### 5.7 Deviations, Modifications, and/or Departures from the FSP or QAPP

Each deviation, modification, and/or departure from this approved FSP or QAPP needs to be approved by the TCEQ PM and/or TCEQ Project QA Specialist and will be recorded, with a discussion of the rationale for each deviation, in the field logbook.

## 6.0 Exceptions, Additions, and Changes to the TCEQ Superfund Program QAPP

Proposed exception to QAPP Element D.2.1.3 (Process for Data Validation): The TCEQ Brownfields Program requests an exception to QAPP Element D.2.1.3 for Dallas West Church of Christ sampling event. The data generated during and from this sampling event will be reviewed per QAPP Elements D.2.1.1 and D.2.1.2 but will not be validated as specified in QAPP Element D.2.1.3.

Proposed exception to QAPP Element D.2.3.1 (Data Usability Summary (DUS)): The TCEQ Brownfields Program requests an exception to QAPP Element D.2.3.1 for Dallas West Church of Christ sampling event. A data usability summary report will not be prepared for this sampling event, as the TCEQ PM will instead review the data review memorandum prepared by the contractor to evaluate the usability of the project data.

### 6.1 Project-Specific Laboratory Changes to Group B (Data Generation and Acquisition) and Group D (Data Validation and Usability)

Accutest Laboratories Gulf Coast, Inc. laboratory has a formal QA program in place that is consistent with the The NELAC Institute (now TNI formerly NELAC) standards. The laboratory has reviewed the QAPP and the FSP and changes to the TCEQ Superfund QAPP are discussed below. The changes are listed by element as they occur in the TCEQ Federal Superfund QAPP (Q-TRAK # 14-453).

Element B.2 Sampling Methods

Element B.2.2 Sample Volumes, Container Types and Preservation Requirements

Table B.2.2-1 – Sample Containers, Volumes, Preservation, and Holding Times

- Exception for Container. The preparatory method listed for volatile organic analysis of soils requires use of Encore, or equivalent, samplers for low level volatile analysis.

## Element B.3 Sample handling and Custody

For custody seals, if the laboratory preparation method indicates the need for use of laboratory-provided Encore (or similar) samplers for soil VOC sample collection, the samples from the same soil sample location will be filled, capped tightly, wrapped in protective wrapping and bagged together in the laboratory provided storage bag. The bag will then be closed and a custody seal placed across the closure.

## Element B.3.2 Laboratory Sample Handling and Custody

- The laboratory meets exception for procedures ensuring internal laboratory C-O-C. The analytical laboratory does not utilize internal C-O-C procedures.
- Exception for sample disposal. The laboratory will dispose of samples 30 days after final report submittal.

## Element B.4 Analytical Methods

## Element B.4.1 Screening Methods

Table B4.1-1 SW846 - Percent Moisture

- The laboratory references analytical method ASTM D2216-90 rather than SW-846 (Section 7.2 of SW3550).

Element B.4.1.3 EPA Method SW1030-Ignitability of Solids

- Laboratory references EPA SW-846 Section 7.1.2.

## Element B.5.1 Definitive Analytical Methods

This element states that if lab limits are more stringent than those in the tables, the laboratory control limits shall be used. Some limits are wider and some are tighter. See exception below for Table B.5.1.9-2.

### Element B.5.1.9 Method 8260C – Volatile Organics

- Exception on list of MQLs for analytes (Table B.5.1.9-1): Analytical laboratory MQLs are different for several COCs. Current laboratory MQLs are presented in Tables 1 and 5 of this FSP.
- Exception for QC Acceptance Criteria (Table B.5.1.9-2): The analytical laboratory uses laboratory derived control limits.

### Element B.5.1.16 Method 6020A – Trace Elements (Metals) by Inductively Coupled Plasma Mass Spectroscopy for Water and Soil

- Exception on list of MQLs for analytes (Table B.5.1.16-1): Analytical laboratory MQLs are different for several COCs. Current laboratory MQLs are presented in Tables 4 and 8 of this FSP.
- Exception for QC Acceptance Criteria (Table B.5.1.16-2): The analytical laboratory uses precision criteria of ≤20% RPD for both water and soil matrices.
- Exceptions to Table B.5.1.16-3:

  The laboratory uses more than one standard to perform the initial calibration and uses a coefficient of determination ($r^2$) ≥ 0.990.

  The analytical laboratory performs a post digestion spike addition only if the serial dilution fails to meet the laboratory criteria of 75-125%.

### Element B.5.3.2 Laboratory Quality Control Samples and Parameters

#### Element B.3.2.1 Laboratory Control Sample

- Exception of failing LCS to reextract and reanalyze all samples associated with the given LCS. If LCS is biased high and the associated samples do not detect target compounds, the data are flagged and noted in an Exception Report on the Laboratory Review Checklist.

#### Element B.5.3.2.7 Method Detection Limit, Method Quantitation Limit, and Sample Detection Limit

- Laboratory MQLs are presented in Section 3.1 of this FSP.

## CHANGES TO GROUP D (DATA VALIDATION AND USABILITY)

### Element D.2 Verification and Validation Methods

#### Element D.2.1 Process for Data Verification and Validation

- Exception of the Laboratory QA section performs package and electronic data format deliverables: The analytical laboratory project manager or designee reviews the completed data packages, performs a reasonableness review on the completed data packages, ensures all deliverables are present, and performs a 5% review of the electronic data deliverable.

# Appendix A: Superfund Standard Operating Procedures

# Appendix B: Laboratory NELAP Accreditation Certificate

This appendix contains an exerpt from the Accutest Laboratory Gulf Coast, Inc NELAP certificate. The excerpt contains:

- PDF Page 1 the certificate number T104704220-14-15 which expires March 31, 2015
- PDF Page 2 lists the analytes in non-potable water analyzed by SW-846 EPA Method 1010 for ignitability and SW-846 EPA 1311 for the Toxicity Leaching Characteristic Procedure.
- PDF Page 12 lists the analytes in non-potable water analyzed by SW-846 EPA Method 6020 for metals.
- PDF Pages 20-28 lists the analytes in non-potable water analyzed by SW-846 EPA Method 8260 for VOCs, SW-846 EPA Method 8270 for SVOCs, and SW-846 EPA Method 9040 for pH analysis.
- PDF Page 32 lists the analytes in non-potable water analyzed by TCEQ Method 1005 for total petroleum hydrocarbons.
- PDF Page 33 lists the analytes in solid/chemical matrixes (soils) analyzed by SW-846 EPA Method 1010 for ignitability and SW-846 EPA 1311 for the Toxicity Leaching Characteristic Procedure.
- PDF Pages 34-35 lists the analytes in solid/chemical matrixes (soils) analyzed by SW-846 EPA Method 6020 for metals.
- PDF Pages 38-46 lists the analytes in solid/chemical matrixes (soils) analyzed by SW-846 EPA Method 8260 for VOCs, SW-846 EPA Method 8270 for SVOCs, SW-846 EPA Method 9040 for pH and corrosivity, and SW-9045 for pH and corrosivity analysis.
- PDF Page 48 lists the analytes in soil analyzed by TCEQ Method 1005 for total petroleum hydrocarbons.

# Appendix C: Project Schedule

*Dates subject to change based on field sampling plan approval and TCEQ Notice to Proceed.

| Task | Bullet Description of Activity | Anticipated Start Date* | Anticipated Date of Completion* |
|---|---|---|---|
| Task 1 | • HASP Preparation and FSP Review. | August 26, 2014 | October 17, 2014 |
| Task 2 | • Mobilize to the site and collect a GPS coordinate for the site;<br>• Meet with TCEQ and/or EPA representatives to outline the proposed boundaries (as understood from interviews with property representatives) for the community garden;<br>• Install 15 soil borings across three identified sections of the site and collect soil samples following a tiered sampling/analysis system;<br>• Install three (3) temporary monitoring wells and collect groundwater samples; and<br>• Ship samples to the laboratory. | October 20, 2014 | October 31, 2014 |
| Task 3 | • Review laboratory data and submit data review memorandum and associated analytical data packages. | November 3, 2014 | November 14, 2014 |
| Task 4 | • Prepare and submit the Phase II ESA Report. | November 17, 2014 | November 28, 2014 |
| Task 5 | • Coordinate with landfill for waste disposal classification/acceptance and remove investigation derived waste. | December 1, 2014 | December 5, 2014 |